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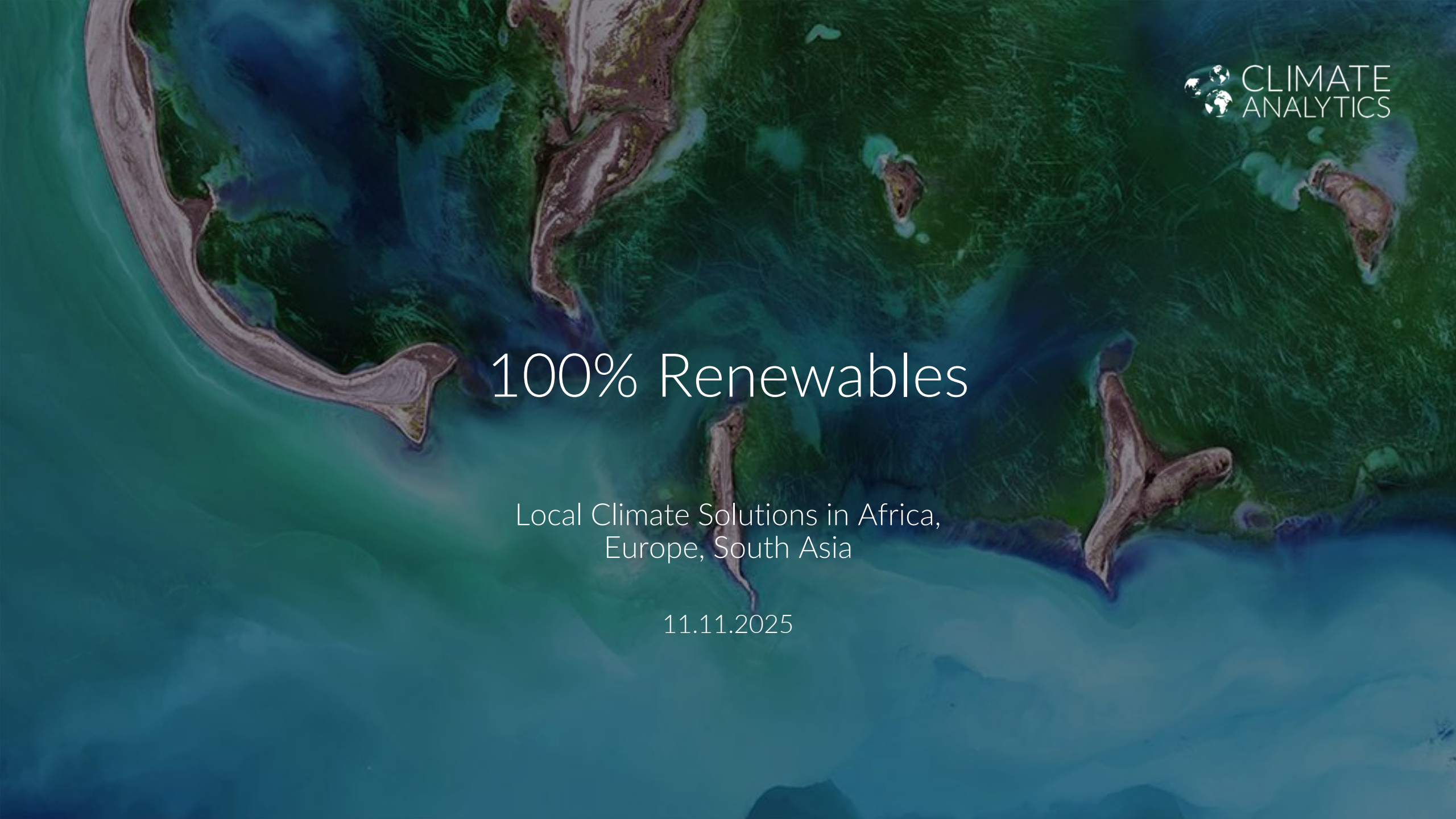
Side Event: Tue. 11 Nov. 18:30-20:00, Room: #7, https://inforse.org/cop30.php

100% Renewables, Local Climate Solutions in Africa, Europe, South Asia

Hard to Abate Sectors

Danial Riaz, Climate Analytics



CLIMATE ANALYTICS

100% Renewables

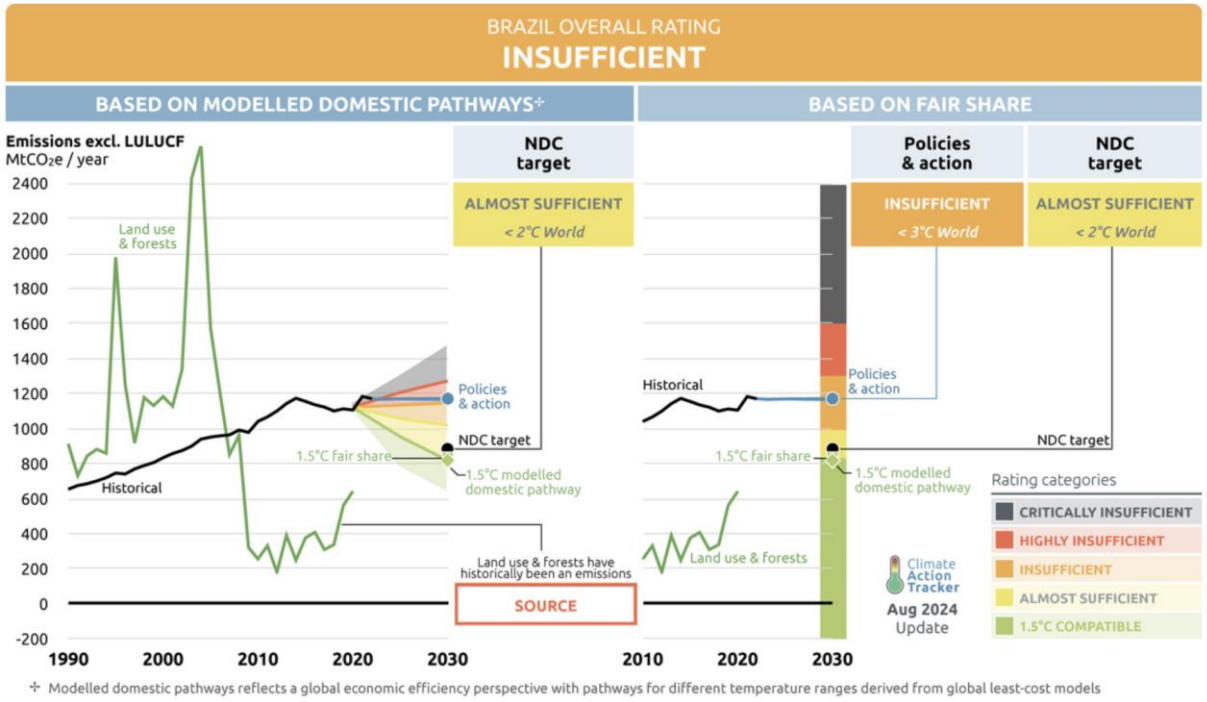
Local Climate Solutions in Africa,
Europe, South Asia

11.11.2025

A bit about Climate Analytics

- A global climate science and policy institute engaged around the world in driving and supporting climate action aligned to the 1.5°C warming limit.

- We connect science and policy to empower vulnerable countries in international climate negotiations and inform national planning with targeted research, analysis and support.



Real zero vs net zero

The need for 100% Renewables

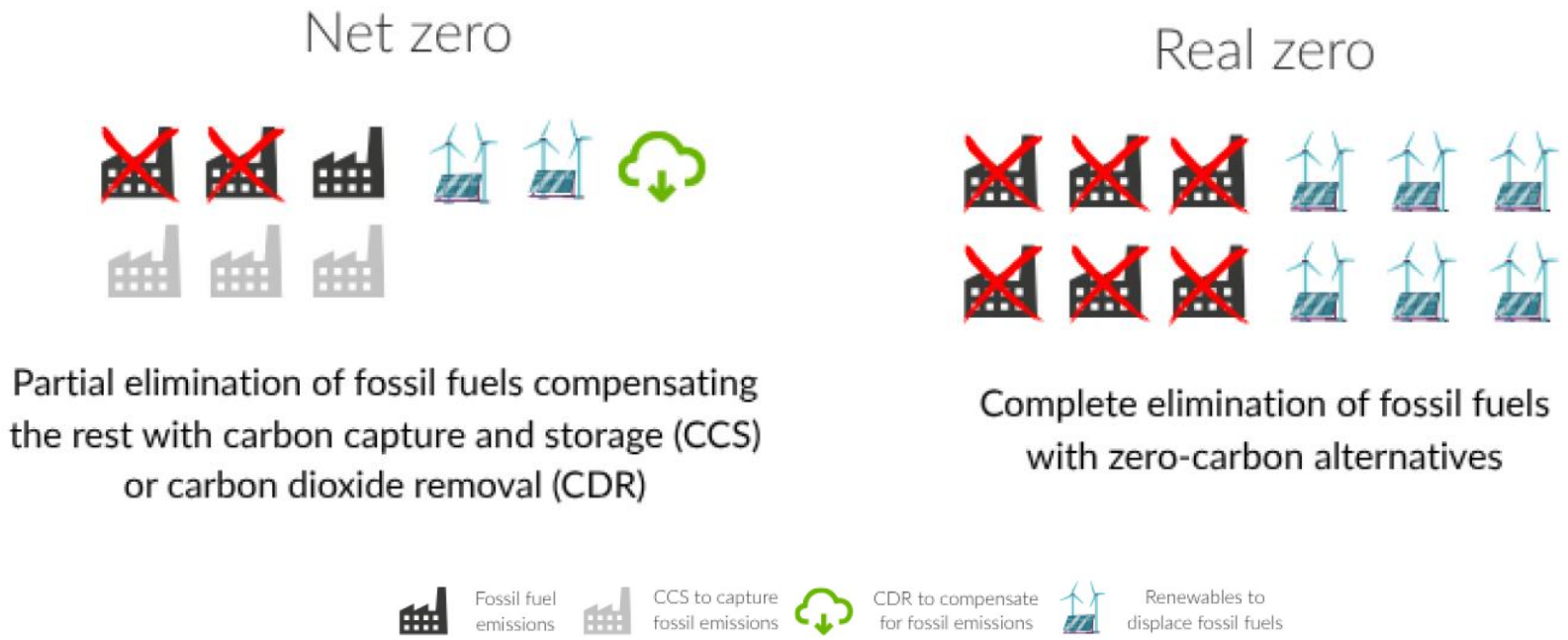


Figure ES1: The difference between real zero and net zero emissions goals

- Not all net zero goals are created equal. Many rely heavily on CCS and CDR
- Different from real zero: the complete elimination of fossil fuels by replacing them with zero-carbon alternatives

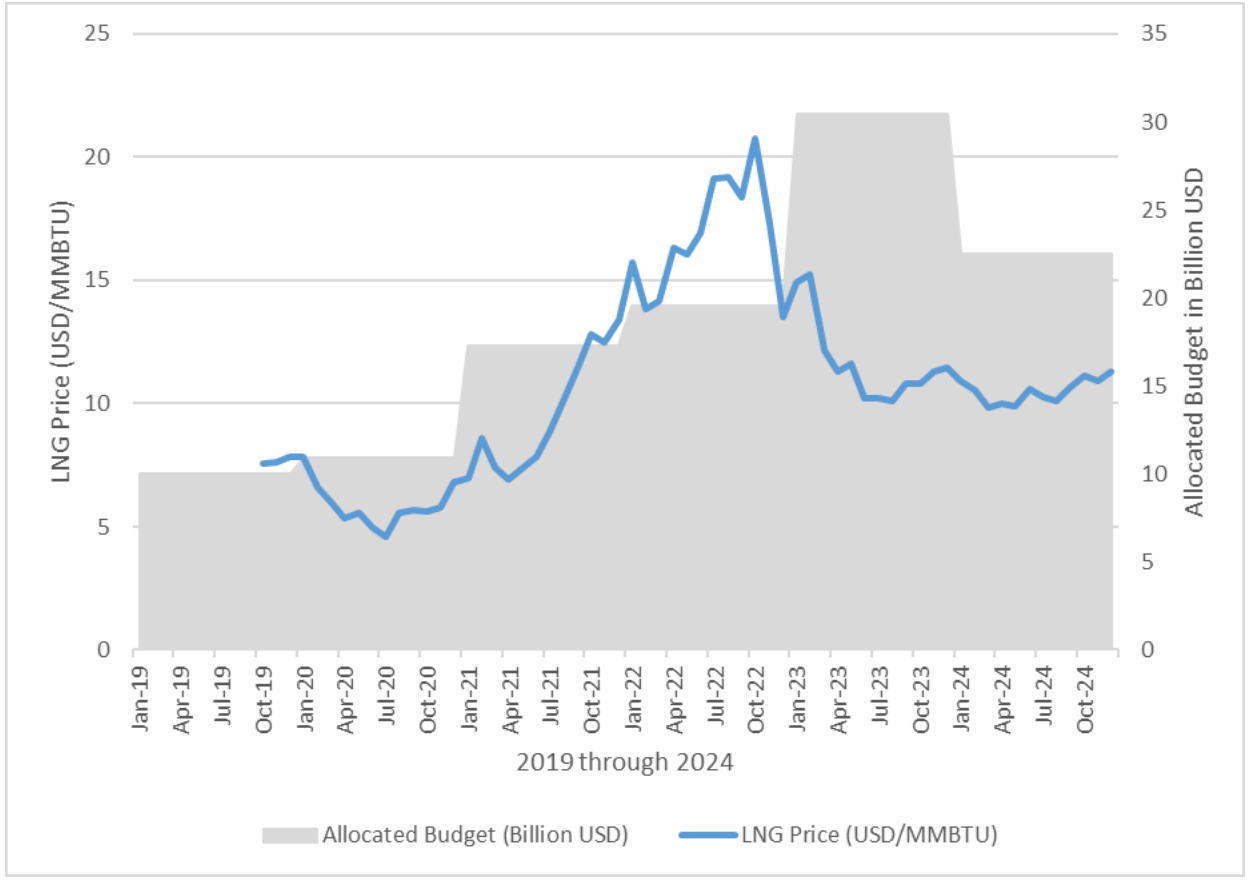
Renewables as a key driver in decarbonizing

not just Power and Transport sectors but also Industry

- Sectors once considered “hard-to-abate” (like steel, shipping, and trucking) are now seeing zero-carbon options become competitive.
- Achieving real zero is possible in many sectors by the early 2040s, especially in leading regions, and can bring operational savings and economic “first-mover” advantages.

Fertiliser sector (India)
Challenges

- India is the second-largest consumer of fertilisers in the world
- Massive Import burden due to imported fertilisers - valued at $40bn USD projected to grow to $70bn USD by 2032
- Does produce a lot of domestic Urea but almost entirely run on fossil gas. About 80% of this gas is imported
- Local fertiliser costs tied to volatile gas prices.
- Gas can account for as much as 70-80% of total production costs



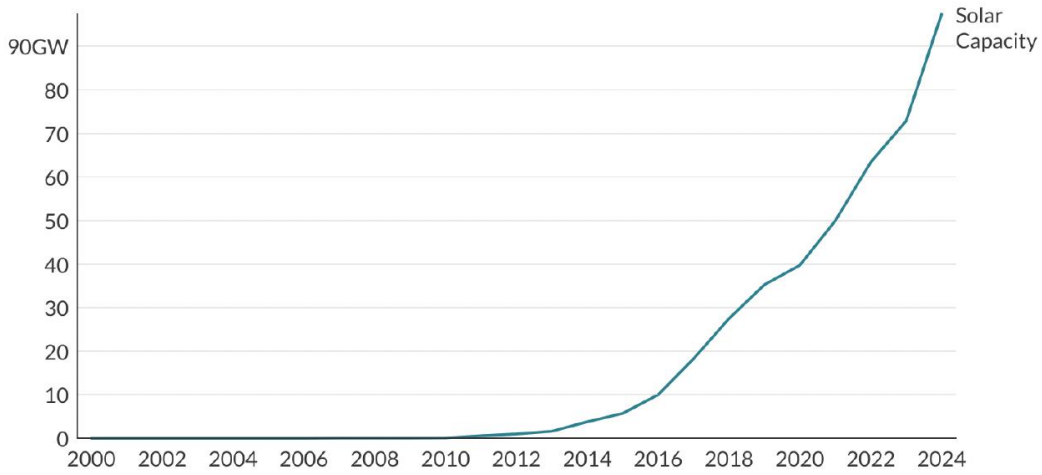
Analysis of LNG spot prices against the annual budget allocation by The Ministry of Chemicals and Fertilisers (Department of Fertilisers)

Fert sector (India)

Opportunities

- Solar capacity in India has grown significantly over the last 15 years, reaching near 100 GW (2010: <1GW) in 2024 (Ember, 2025).
- Solar electricity prices in India dropped from around USD 240/MWh in 2010 to just over USD 30/MWh as of today.
- Solar PV saw the steepest drop, with a global learning rate of 33%,
- Wind (onshore) has also seen similar success, with a learning rate of 20.6%
- Electrolysers have exhibited learning rates of around 23% (AEL) 32% (PEM) over the last 20 years

Solar capacity in India, 2000-2024 (GW)



Technology	Learning Rate (%)
Solar PV	33
Wind (Onshore)	20.6
Electrolyser (AEL)	23
Electrolyser (PEM)	32

25+ parameters influencing costs

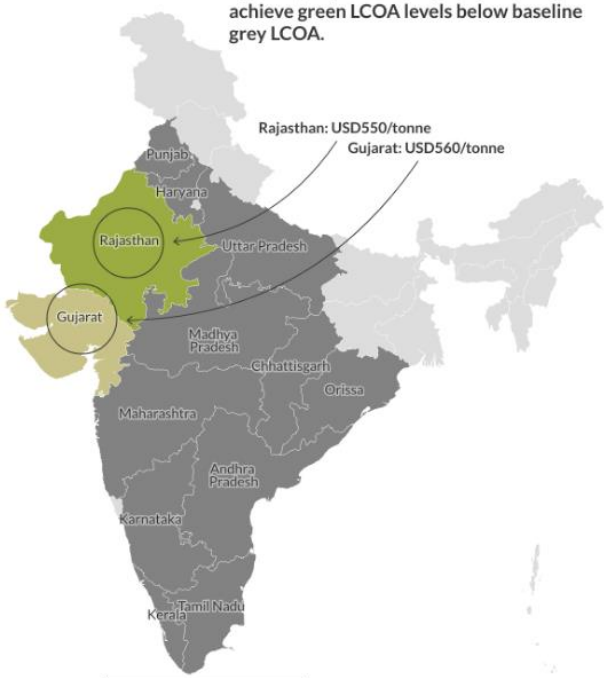
CLIMATE ANALYTICS

Key parameters	LCOE 	LCOH 	LCOA 
Plant utilization (CUF)	Generation profile as per RE Site Location Balancing tech.- Battery storage Curtailment rate	Plant availability based on RE generation Plant availability based on location and connectivity Electrolyser tech. and operating characteristic	Plant availability based on RE generation Plant availability based on H2 generation Plant availability based H2 storage (balancing tech.)
Policy definition and charges	Grid charges as per CTU/STU connectivity of RE-NH3 plants Waive-offs and incentives on grid charges	Type of Settlement: Monthly vs Hourly Power Banking vs No Banking	Type of Settlement: Monthly vs Hourly Power Banking vs No Banking
Capex and Opex	RE Tech.- Solar, ON wind, OF wind, Storage and learning rate Year of commissioning of plant: 2025-2034 System size in MW	Electrolyser tech: Alkaline, PEM and learning rate Water source: Desalination vs Pipeline System size in Tonne per Day/ MW	NH3 tech: Haber Bosch and learning rate ASU tech: Cryogenic System size in Tonne per Day/ MW
Cost of capital	Cost of debt and equity Debt: Equity ratio Depreciation rate and cashflow duration	Cost of debt and equity Debt: Equity ratio Depreciation rate and cashflow duration	Cost of debt and equity Debt: Equity ratio Depreciation rate and cashflow duration

Green vs Grey LCOA by state

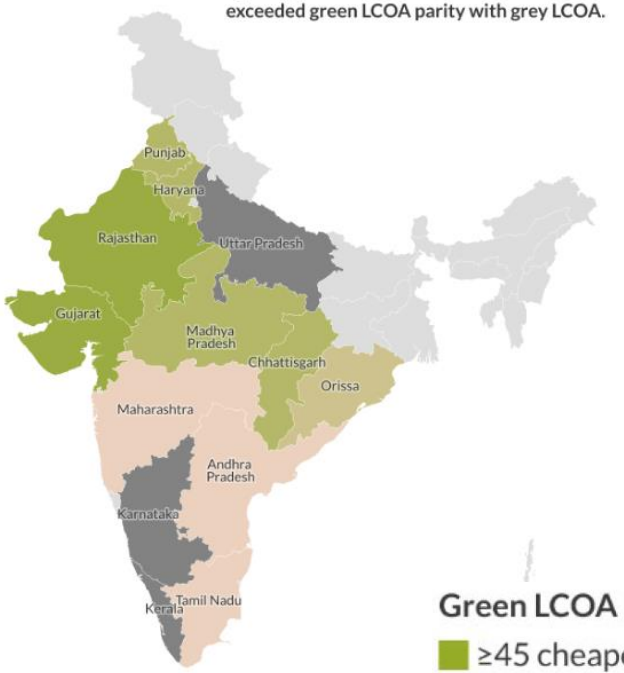
2026

By 2030, Gujarat and Rajasthan already achieve green LCOA levels below baseline grey LCOA.



2030

By 2034, 10 states have achieved and exceeded green LCOA parity with grey LCOA.



2034

Green LCOA (USD/tonne)

- ≥45 cheaper v. grey
- 30-44 cheaper v. grey
- 15-29 cheaper v. grey
- 0-14 cheaper v. grey
- Economically Uncompetitive

Market Data – auction results from 2025

- Market data is reflective of our modelling result
- 13 bids from SECI's green ammonia tender earlier this year
- Jackson Green won at approx. $572/tonne

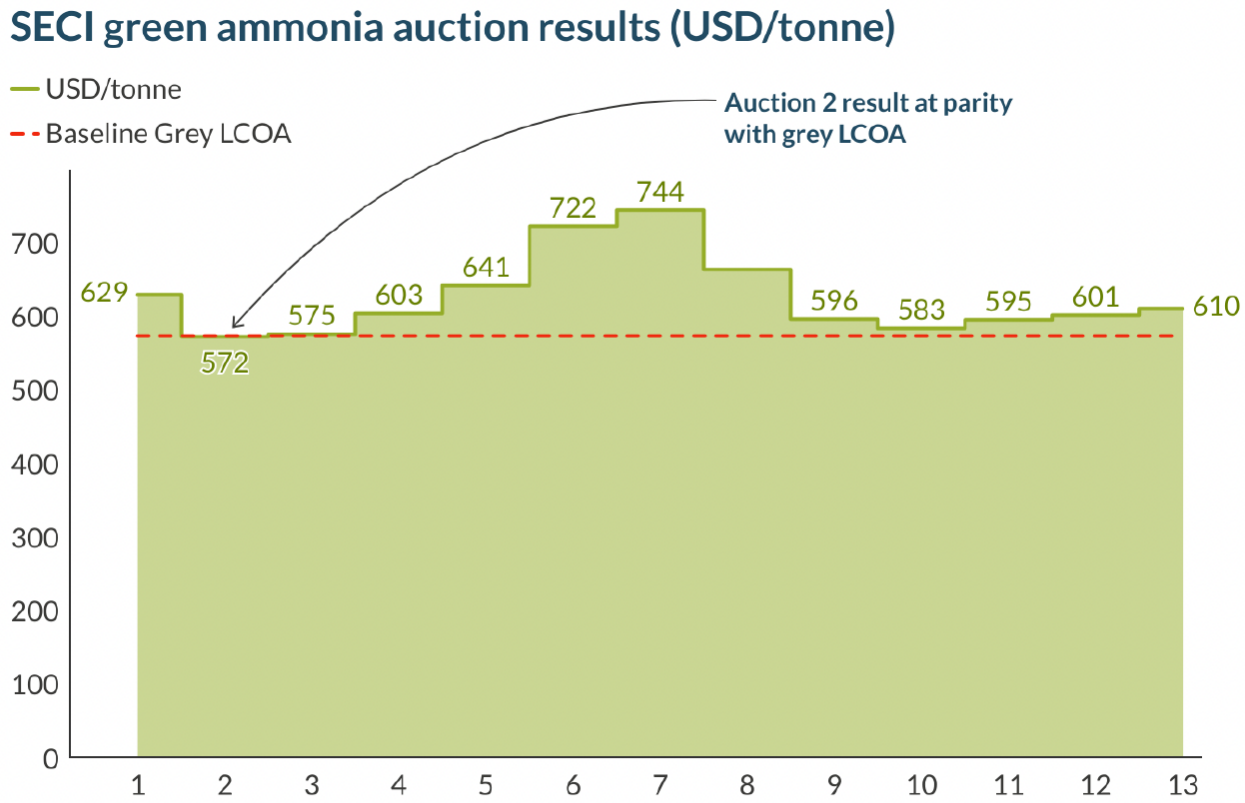
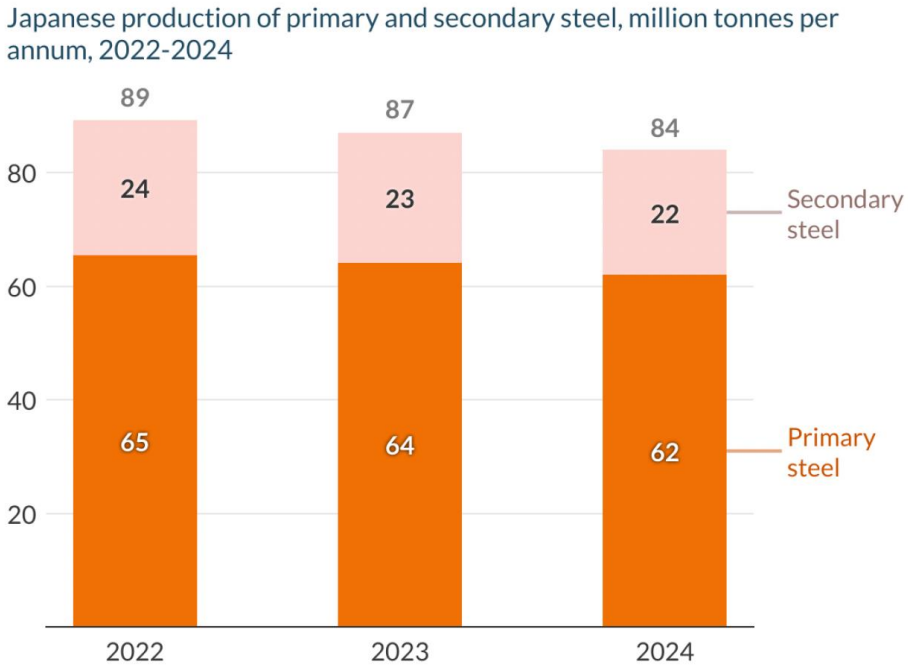


Figure 3 Winning bids from the Solar Energy Corporation of India auctions for the year of 2025 production of green ammonia (SECI, 2025).

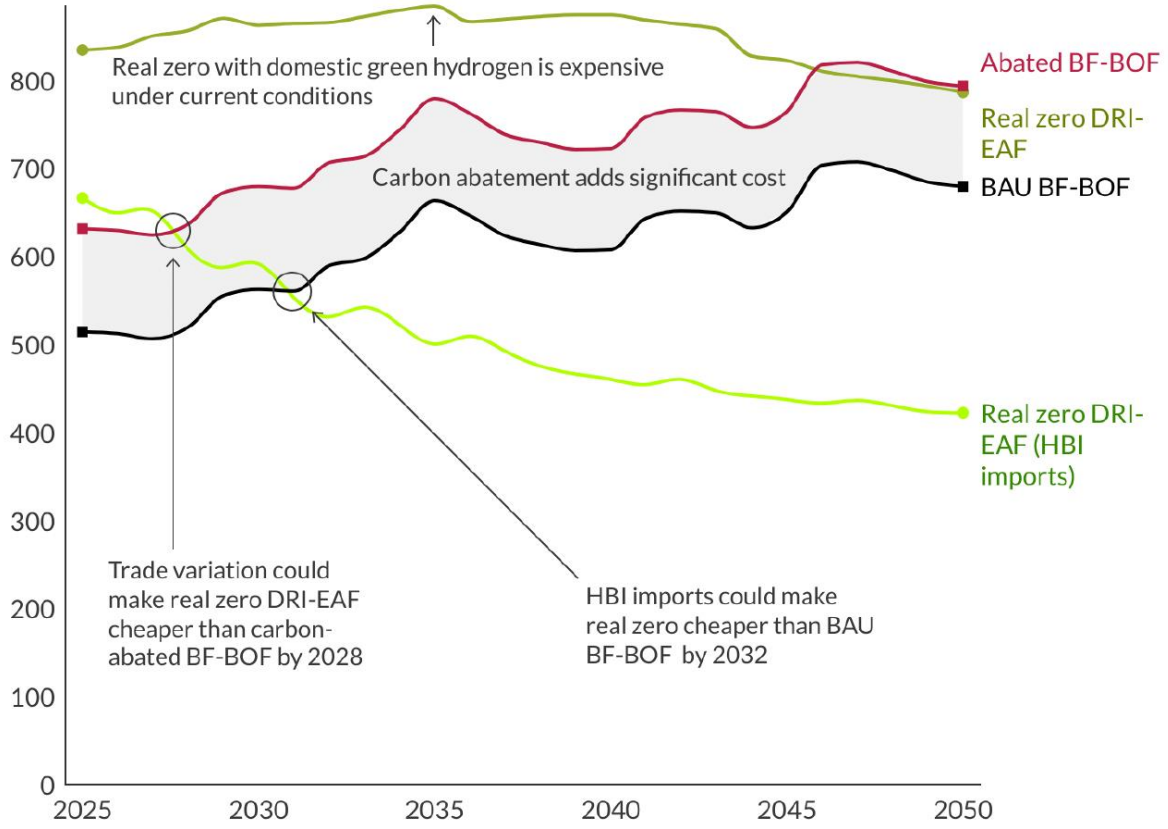
Steel (Japan)

- Conducted similar analysis on ‘LCOS’ in Japan
- Japan is the world’s third-largest steelmaker and second-largest steel exporter
- Steelmaking accounts for up to 14% of Japan’s CO2 emissions.
- Japanese steelmakers and officials, adamant on carbon-abated approach sighting “cost-competitiveness” and “energy and economic security”
- Less than 30% of production from Secondary Steel



Steel (Japan)

- For secondary steel production, a commercially viable real zero technology is already the most economically appealing.
- For primary steel production, green hydrogen-based DRI-EAF production, using HBI imports, can make real zero cost-competitive against BAU as early as 2032

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